

# FEDERAL POWER TRIODE Type F-124-A 40 Kilowatts Plate Dissipation



## GENERAL DATA

### DESCRIPTION:

Federal's F-124-A is a three-electrode tube designed for use as radio-frequency amplifier, oscillator, or Class B modulator. The anode is water-cooled, capable of dissipating 40 kilowatts. The cathode, a pure tungsten multi-strand filament, may be operated on DC, 1  $\phi$ , 3  $\phi$ , or 6  $\phi$  AC excitation. Maximum ratings apply up to 20 megacycles.

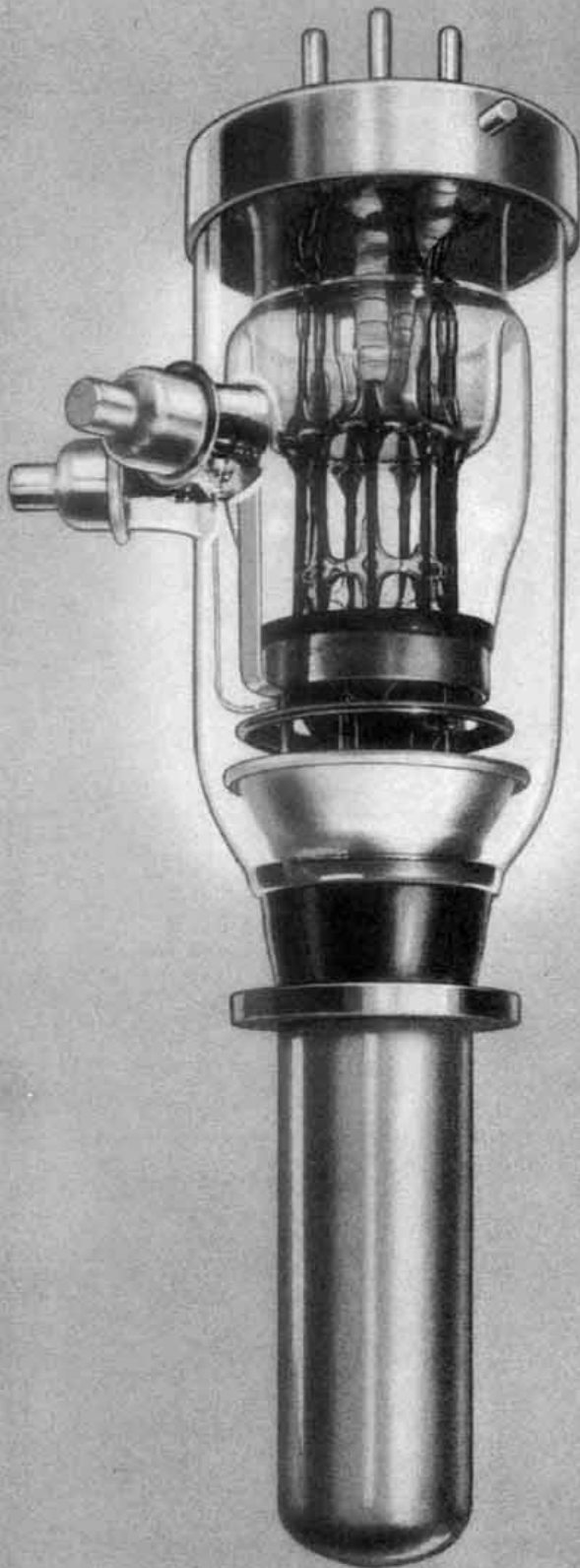
### Electrical:

▶ Filament Voltage§	27.2 Volts
▶ Filament Current§	205.5 Amperes
▶ Filament Starting Current§	308 Amperes max.
▶ Filament Cold Resistance	.015 Ohms
▶ Peak Cathode Current	35 Amperes
▶ Amplification Factor, at	
$I_b = 1.6$ amps	
$E_c = -200$ volts	40.5
▶ Interelectrode Capacitances	
Grid-Plate	35 $\mu\mu\text{f}$
Grid-Filament	46 $\mu\mu\text{f}$
Plate-Filament	5.6 $\mu\mu\text{f}$

§Single phase excitation.

### Mechanical:

▶ Mounting Position—Vertical, anode down	
▶ Type of Cooling—Water	
Water Flow on Anode	15 GPM Min.
Maximum Outgoing Water Temperature	70° C
Maximum Glass Temperature	150° C
▶ Net Weight, approximate	11½ Pounds



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For many years leading broadcast stations have chosen Federal's F-124-A for their 50 kilowatt transmitters . . . convincing evidence that F-124-A service satisfies.

## Maximum Ratings and Typical Operating Conditions

### AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR—CLASS B

#### Maximum Ratings, Absolute Values

DC Plate Voltage	20,000 Volts
Maximum Signal DC Plate Current†	5 Amperes
Maximum Signal Plate Input†	50 Kilowatts
Plate Dissipation†	30 Kilowatts

#### Typical Operation

(Unless otherwise specified, values are for two tubes)

DC Plate Voltage	10,000 Volts
DC Grid Voltage	-200 Volts
Peak A-F Grid-to-Grid Voltage	1,600 Volts
Zero Signal DC Plate Current	0.5 Amperes
Maximum Signal DC Plate Current	6 Amperes
Effective Load Resistance, Plate to Plate	3,750 Ohms
Max. Sig. Driving Power, approx.	360 Watts
Max. Sig. Power Output, approx.	39 Kilowatts

†Averaged over any audio frequency cycle of sine-wave form.

### RADIO-FREQUENCY POWER AMPLIFIER—CLASS B

(Carrier conditions per tube for use with a maximum modulation factor of 1.0)

#### Maximum Ratings, Absolute Values

DC Plate Voltage	20,000 Volts
DC Plate Current	3.5 Amperes
Plate Input	60 Kilowatts
Plate Dissipation	40 Kilowatts

#### Typical Operation

DC Plate Voltage	17,500 Volts
DC Grid Voltage	-300 Volts
Peak R-F Grid Voltage	480 Volts
DC Plate Current	2.1 Amperes
DC Grid Current	-0.02 Amperes
Driving Power, approximate‡	100 Watts
Power Output, approximate	13.1 Kilowatts

‡At crest of audio-frequency cycle with modulation factor of 1.0.

### PLATE-MODULATED RADIO-FREQUENCY POWER AMPLIFIER—CLASS C TELEPHONY

(Carrier conditions per tube for use with a maximum modulation factor of 1.0)

#### Maximum Ratings, Absolute Values

DC Plate Voltage	14,000 Volts
DC Grid Voltage	-3,000 Volts
DC Plate Current	3.5 Amperes
DC Grid Current	1 Ampere
Plate Input	60 Kilowatts
Plate Dissipation	30 Kilowatts

#### Typical Operation

DC Plate Voltage	12,000 Volts
DC Grid Voltage	-725 Volts
Peak R-F Grid Voltage	1,425 Volts
DC Plate Current	3.31 Amperes
DC Grid Current	0.061 Amperes
Driving Power, approximate	200 Watts
Power Output, approximate	26.2 Kilowatts

### RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEGRAPHY

(Key-down conditions per tube without amplitude modulation)†

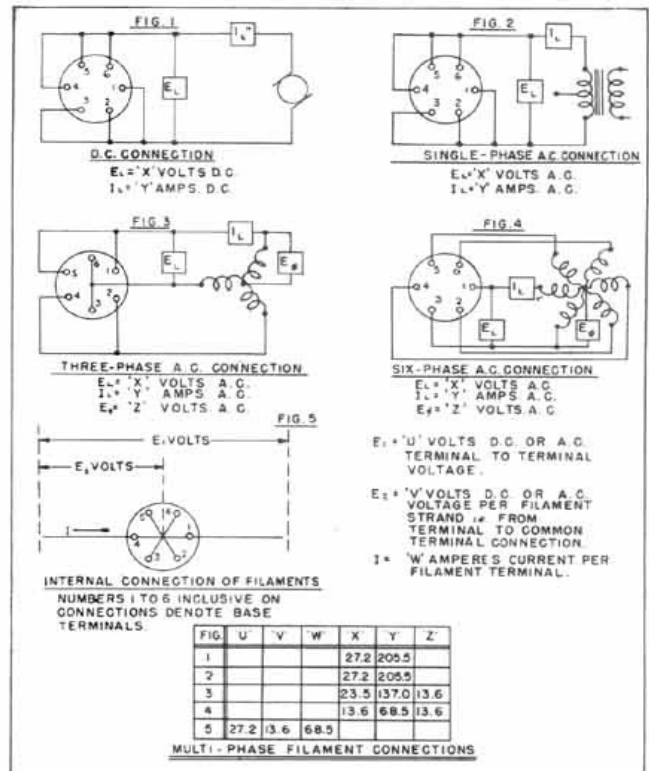
#### Maximum Ratings, Absolute Values

DC Plate Voltage	20,000 Volts
DC Grid Voltage	-3,000 Volts
DC Plate Current	7 Amperes
DC Grid Current	1 Ampere
Plate Input	135 Kilowatts
Plate Dissipation	40 Kilowatts

#### Typical Operation

DC Plate Voltage	18,000 Volts
DC Grid Voltage	-1,100 Volts
Peak R-F Grid Voltage	2,420 Volts
DC Plate Current	6 Amperes
DC Grid Current, approximate	0.65 Amperes
Driving Power, approximate	1.5 Kilowatts
Power Output, approximate	80 Kilowatts

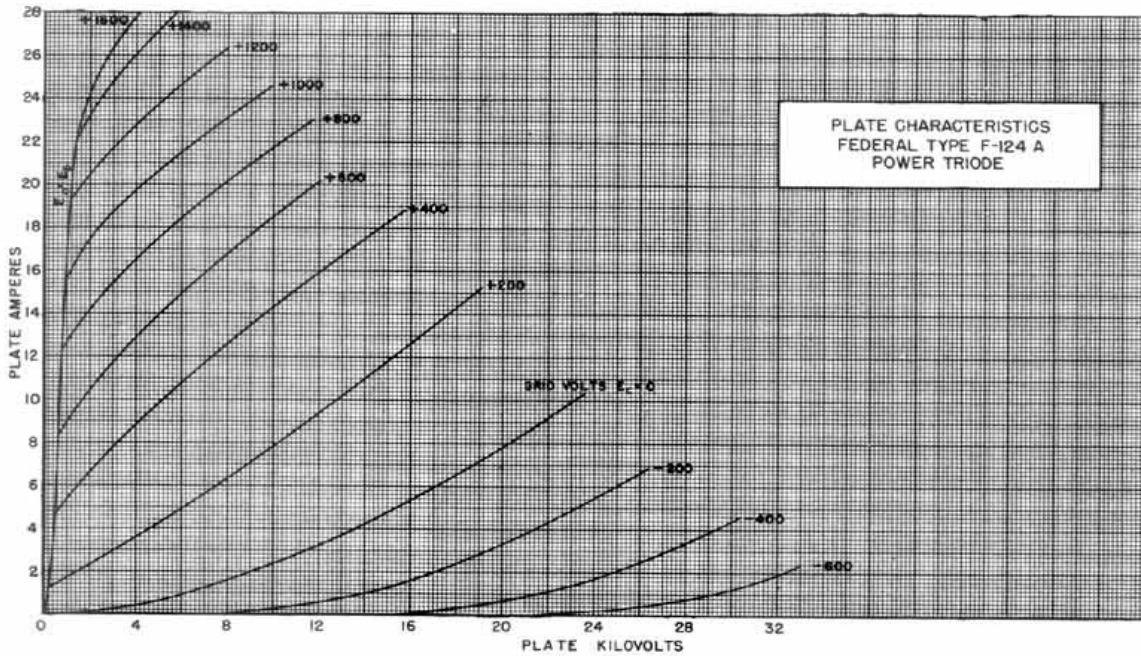
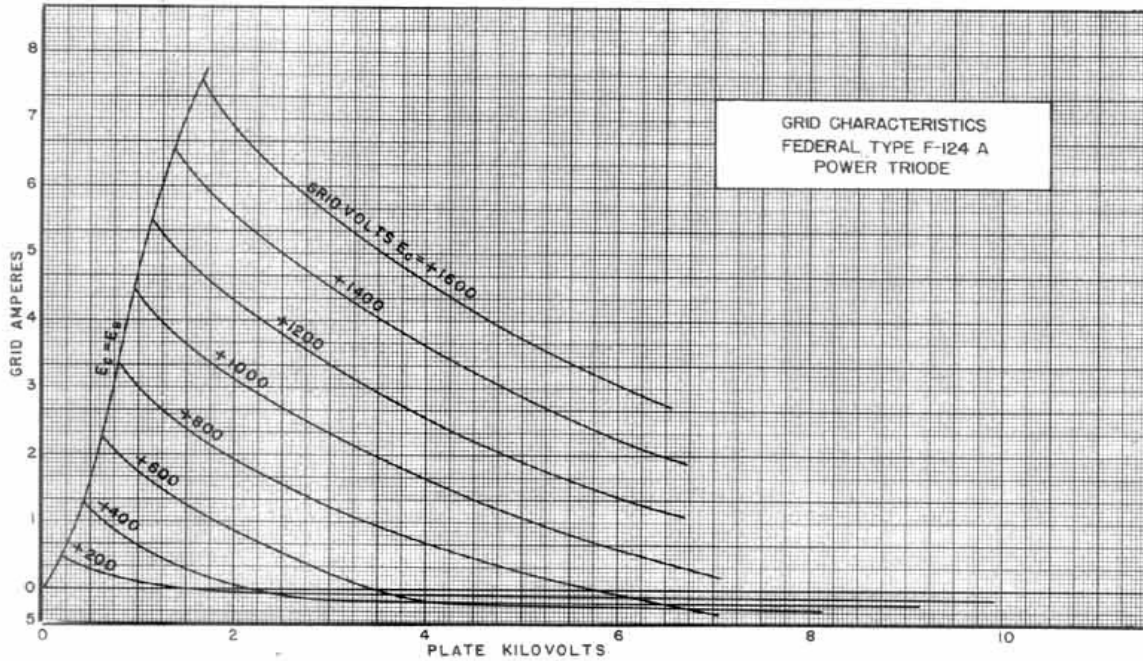
†Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of carrier conditions.



Federal's F-124-A is operative at full rating up to 20 megacycles. It has the staying qualities inherent in all tubes of Federal design and manufacture.

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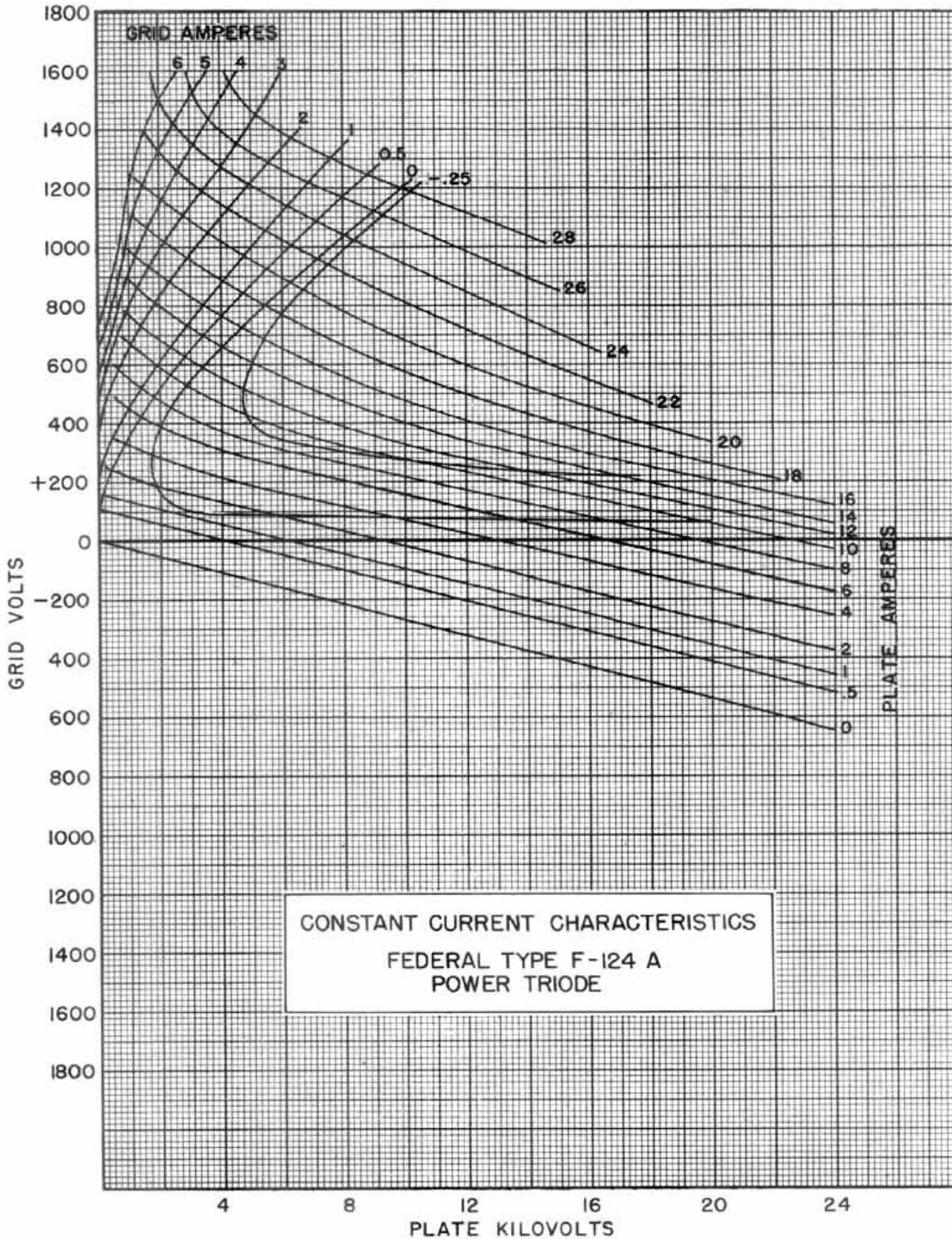
40 Kilowatts Plate Dissipation



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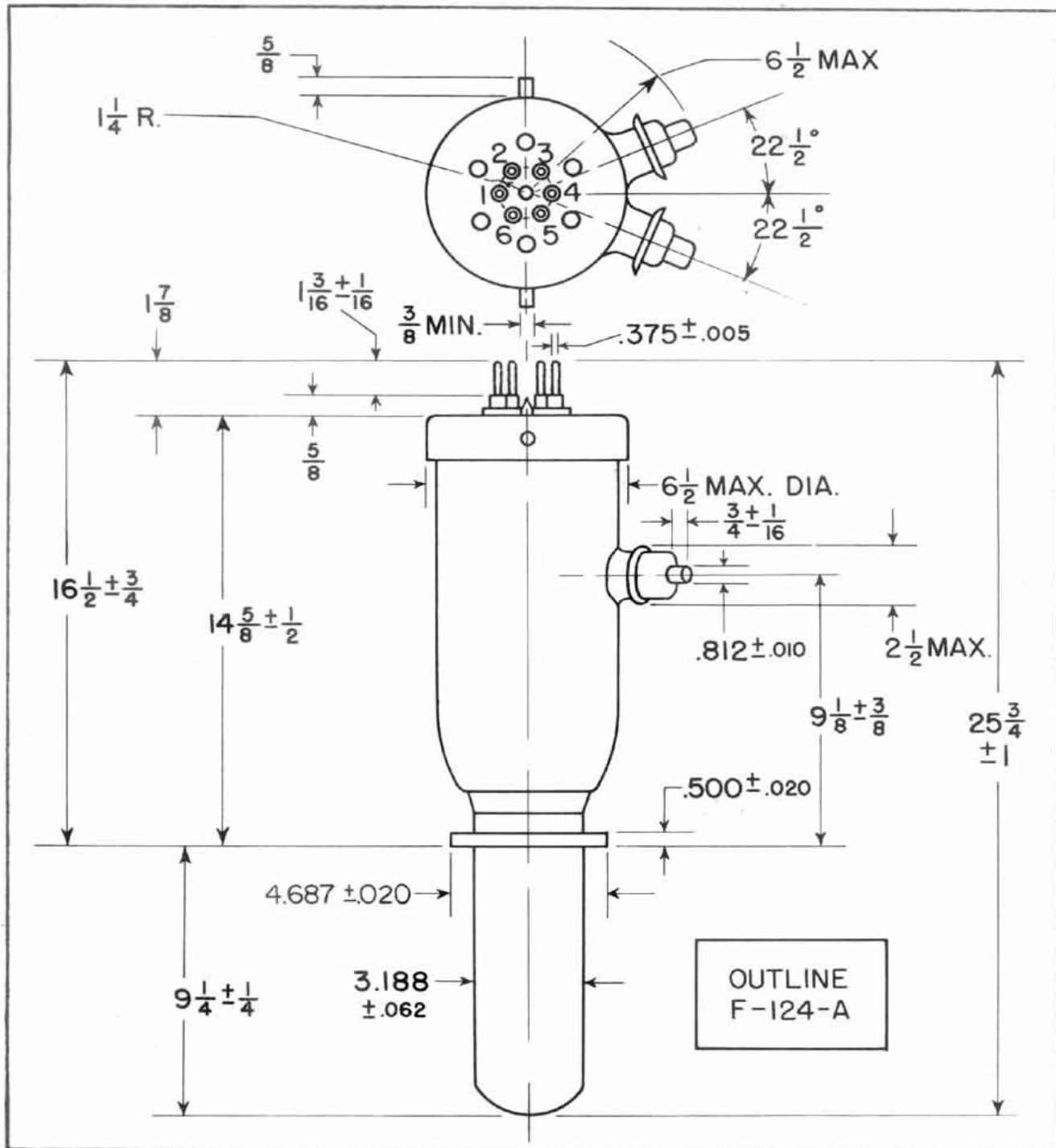
For ease in neutralization the F-124-A makes use of a dual grid terminal . . . Federal never overlooks an opportunity to improve each detail of design.



Federal's parts processing and exhaust techniques are reflected in the F-124-A, a typical example of fine craftsmanship in vacuum tube manufacture.

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40 Kilowatts Plate Dissipation



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